

USE OF A MULTIMISSION SYSTEM FOR COST EFFECTIVE SUPPORT OF PLANETARY SCIENCE DATA PROCESSING

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JPL's Multimission Operations Systems Office (MOSO) provides a multimission facility at JPL for processing science instrument data from NASA's planetary missions. This facility, the Multimission Image Processing System (MIPS), is developed and maintained by MOSO to meet requirements that span the NASA family of planetary missions. Although the word "image" appears in the title, MIPS is used to process instrument data from a variety of science instruments. This paper describes the design of a new system architecture now being implemented within the MIPS to support future planetary mission activities at significantly reduced operations and maintenance cost. Examples of various classes of data products that are produced by the system, including enhanced imagery, science data visualization products, and animations will be shown, and the techniques used to produce each type of product will be described.

The MIPS configuration that has been used to support Voyager, and Magellan flight operations, and the Galileo Earth and Asteroid encounters, is a highly centralized system based on DEC VAX computing equipment running under the VMS operating system. The new system will be a highly distributed system based on the Unix operating system, with significant support provided for international scientists operating remotely from JPL. Image and data display, data management, and production of archival data products exploit recently defined industry standards to insure hardware platform independence, making it possible to evolve the system in the future on commercially available platforms at minimal cost. Significant support of science users not located at JPL is provided by the new system design. Operations and maintenance costs of the new system will be significantly less than the centralized system that has been in use for approximately ten years.

The VICAR software system developed by MIPS has been used to process planetary science data returned from NASA missions for over twenty years. The software is also used internationally by science team members involved in the NASA planetary program, and is made available to commercial organizations through NASA's COSMIC code distribution center. A modular design is used, where same general purpose software modules can be applied to data from a variety of instruments. The VICAR system is being modified to operate under Unix and will be transportable to a wide variety of hardware platforms.

Examples of use of this multimission system on several future missions, including the MESUR Pathfinder mission, will be described, to illustrate the ease with which the new modular design can be adapted to various classes of planetary missions at minimal adaptation cost. Many principal investigators are finding it cost effective to utilize a multimission facility with established equipment, software, and interfaces with the telemetry processing system to generate the first level data records for their instruments and to support other data processing requirements using inherited software or the shared use of expensive equipment at JPL,